

In response to the Office Action mailed May 3, 2002, the Examiner is respectfully requested to consider and enter the following amendments:

IN THE CLAIMS:

All claims currently pending in this application, including those not presently being amended, have been reproduced below for the Examiner's convenience.

1. (Unamended) A speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

first calculation means for calculating a distance between first two pitch marks of a voiced portion of speech data to be processed;

second calculation means for calculating a difference between adjacent inter-pitch-mark distances; and

management means for storing the calculation results obtained by said first and second calculation means in a file and managing the results.

2. (Unamended) A speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

first calculation means for calculating a distance between first two pitch marks of a voiced portion of speech data to be processed;

second calculation means for calculating a difference between adjacent inter-pitch-mark distances; and

management means for storing the calculation results obtained by said first and second calculation means in a file and managing the results,

wherein said management means further calculates an inter-voiced-portion distance as a distance between voiced portions on both sides of an unvoiced portion, stores the distance in the file, and manages the distance.

3. (Unamended) The apparatus according to claim 1, further comprising counting means for counting the number of pitch marks of the voiced portion, and when the number of pitch marks is counted by said counting means, said management means stores the number of pitch marks in the file and manages the number of pitch marks.

4. (Unamended) A speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

first comparison means for, when a length of speech data to be processed is represented by  $d$ , and a maximum value  $d_{\max}$  and a minimum value  $d_{\min}$  are defined for a predetermined word length, comparing the length  $d$  with the maximum value  $d_{\max}$ ;

second comparison means for comparing the length  $d$  with the minimum value  $d_{\min}$  on the basis of the comparison result obtained by said first comparing means;

subtraction means for subtracting the maximum value  $d_{\max}$  or minimum value  $d_{\min}$  from the length  $d$  on the basis of the comparison results obtained by said first and second comparison means; and

management means for storing the difference obtained by said subtraction means or the length  $d$  in the file and managing the difference or the length on the basis of the comparison results obtained by said first and second comparison means.

5. (Unamended) The apparatus according to claim 4, wherein said subtraction means subtracts the maximum value  $d_{\max}$  from the length  $d$  when the comparison result obtained by said first comparison means indicates that the length  $d$  is not less than the maximum value  $d_{\max}$ , and subtracts the minimum value  $d_{\min}$  from the length  $d$  when the comparison result obtained by said second comparison means indicates that the length  $d$  is not more than the minimum value  $d_{\min}$ .

6. (Unamended) A speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

storage means for storing a file for managing a distance between first two pitch marks of a voiced portion of speech data to be processed and a difference between adjacent inter-pitch-mark distances;

first loading means for loading the distance between the first two pitch marks of the voiced portion;

second loading means for loading the difference between the adjacent inter-pitch-mark distances; and

calculation means for calculating a next pitch mark position from a pitch mark position calculated immediately before the calculation, a pitch mark distance to an adjacent pitch mark, and the distance and difference loaded by said first and second loading means.

7. (Unamended) The apparatus according to claim 6, wherein in the file stored in said storage means, a distance between voiced portions on both sides of an unvoiced portion is managed, and

said calculation means loads the distance between the voiced portions on both sides of the unvoiced portion when processing is to be performed for the next voiced portion.

8. (Unamended) The apparatus according to claim 6, wherein when a data length of data to be processed is held, and a maximum value  $d_{max}$  and a minimum value  $d_{min}$  are defined for a predetermined word length, fixed-length data  $d_f$  is also managed in the file stored in said storage means, and

it is checked whether a value obtained by loading the fixed-length data  $d_f$  and adding  $d$  to the data  $d_f$  is equal to the maximum value  $d_{max}$  or the minimum value  $d_{min}$ , and the fixed-length data  $d_f$  is loaded when the value is equal to the maximum value  $d_{max}$  or the minimum value  $d_{min}$ .

9. (Unamended) A control method for a speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

a first calculation step of calculating a distance between first two pitch marks of a voiced portion of speech data to be processed;

a second calculation step of calculating a difference between adjacent inter-pitch-mark distances; and

a management step of storing the calculation results obtained in said first and second calculation steps in a file and managing the results.

10. (Unamended) A control method for a speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

- a first calculation step of calculating a distance between first two pitch marks of a voiced portion of speech data to be processed;
- a second calculation step of calculating a difference between adjacent inter-pitch-mark distances; and
- a management step of storing the calculation results obtained in said first and second calculation steps in a file and managing the results,

wherein said management step further comprises calculating an inter-voiced-portion distance as a distance between voiced portions on both sides of an unvoiced portion, storing the distance in the file, and managing the distance.

11. (Unamended) The method according to claim 9, further comprising a counting step of counting the number of pitch marks of the voiced portion, and

- when the number of pitch marks is counted in said counting step, said management step comprises storing the number of pitch marks in the file and manages the number of pitch marks.

12. (Unamended) A control method for a speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

- a first comparison step of, when a length of speech data to be processed is represented by  $d$ , and a maximum value  $d_{max}$  and a minimum value  $d_{min}$  are defined for a predetermined word length, comparing the length  $d$  with the maximum value  $d_{max}$ ;

a second comparison step of comparing the length  $d$  with the minimum value  $d_{min}$  on the basis of the comparison result obtained in said first comparing step;

a subtraction step of subtracting the maximum value  $d_{max}$  or minimum value  $d_{min}$  from the length  $d$  on the basis of the comparison results obtained in said first and second comparison steps; and

a management step of storing the difference obtained in the subtraction step or the length  $d$  in the file and managing the difference or the length on the basis of the comparison results obtained in said first and second comparison steps.

13. (Unamended) The method according to claim 12, wherein said subtraction step comprises subtracting the maximum value  $d_{max}$  from the length  $d$  when the comparison result obtained in said first comparison step indicates that the length  $d$  is not less than the maximum value  $d_{max}$ , and subtracting the minimum value  $d_{min}$  from the length  $d$  when the comparison result obtained in said second comparison step indicates that the length  $d$  is not more than the minimum value  $d_{min}$ .

14. (Unamended) A control method for a speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

a storage step of storing a file for managing a distance between first two pitch marks of a voiced portion of speech data to be processed and a difference between adjacent inter-pitch-mark distances;

a first loading step of loading the distance between the first two pitch marks of the voiced portion;

a second loading step of loading the difference between the adjacent inter-pitch-mark distances; and

a calculation step of calculating a next pitch mark position from a pitch mark position calculated immediately before the calculation, a pitch mark distance to an adjacent pitch mark, and the distance and difference loaded in said first and second loading steps.

15. (Unamended) The method according to claim 14, wherein in the file stored in said storage step, a distance between voiced portions on both sides of an unvoiced portion is managed, and

a calculation step comprises loading the distance between the voiced portions on both sides of the unvoiced portion when processing is to be performed for the next voiced portion.

16. (Unamended) The method according to claim 14, wherein fixed-length data  $d_f$  in the file stored in said storage step when a data length of data to be processed is held, and a maximum value  $d_{max}$  and a minimum value  $d_{min}$  are defined for a predetermined word length, and

a step of checking whether a value obtained by loading the fixed-length data  $d_f$  and adding  $d$  to the data  $d_f$  is equal to the maximum value  $d_{max}$  or the minimum value  $d_{min}$ , and loading the fixed-length data  $d_f$  when the value is equal to the maximum value  $d_{max}$  or the minimum value  $d_{min}$ .

17. (Unamended) A computer-readable memory storing program codes for controlling a speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

a program code for the first calculation step of calculating a distance between first two pitch marks of a voiced portion of speech data to be processed;

a program code for the second calculation step of calculating a difference between adjacent inter-pitch-mark distances; and

a program code for the management step of storing the calculation results obtained in the first and second calculation steps in a file and managing the results.

18. (Unamended) A computer-readable memory storing program codes for controlling a speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

a program code for the first comparison step of, when a length of speech data to be processed is represented by  $d$ , and a maximum value  $d_{\max}$  and a minimum value  $d_{\min}$  are defined for a predetermined word length, comparing the length  $d$  with the maximum value  $d_{\max}$ ;

a program code for the second comparison step of comparing the length  $d$  with the minimum value  $d_{\min}$  on the basis of the comparison result obtained in said first comparing step;

a program code for the subtraction step of subtracting the maximum value  $d_{\max}$  or minimum value  $d_{\min}$  from the length  $d$  on the basis of the comparison results obtained in said first and second comparison steps; and



a program code for the management step of storing the difference obtained in the subtraction step or the length d in the file and managing the difference or the length on the basis of the comparison results obtained in said first and second comparison steps.

19. (Unamended) A computer-readable memory storing program codes for controlling a speech synthesis apparatus for performing speech synthesis by using pitch marks, comprising:

a program code for the storage step of storing a file for managing a distance between first two pitch marks of a voiced portion of speech data to be processed and a difference between adjacent inter-pitch-mark distances;

a program code for the first loading step of loading the distance between the first two pitch marks of the voiced portion;

a program code for the second loading step of loading the difference between the adjacent inter-pitch-mark distances; and

a program code for the calculation step of calculating a next pitch mark position from a pitch mark position calculated immediately before the calculation, a pitch mark distance to an adjacent pitch mark, and the distance and difference loaded in said first and second loading steps.

#### REMARKS

The claims now pending in this application are Claims 1-19, with Claims 1, 2, 4, 6, 9, 10, 12, 14, and 17-19 being the independent claims. Claims 2, 4-8, 10, 12-16, 18, and 19 have been allowed.